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(71) Applicant *(for all designated States except US)*: **TREFILARBED BISSEN S.A.** [LU/LU]; Route de Finsterthal, B.P. 16, L-7703 Bissen (LU).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **FELGEN, Fernand** [LU/LU]; 14, rue J. B. Neuens, L-7553 Mersch (LU).

(74) Agents: **BEISSEL, Jean** et al.; Office Ernest T. Freylinger S.A., B.P. 48, L-8001 Strassen (LU).

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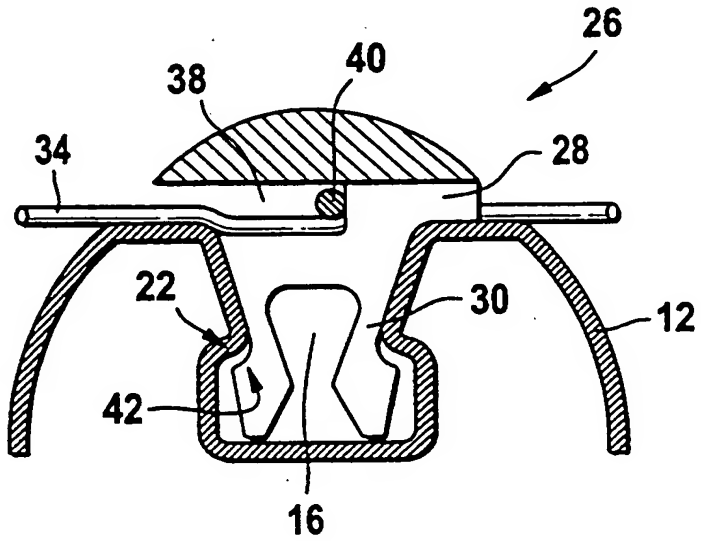
(54) Title: SYSTEM FOR FIXING FENCING MATERIAL TO A FENCE POST



(57) Abstract: System for fixing fencing material to a fence post (10) comprising a fence post (10) and at least one fixing device (26). Said fence post (10) has an axial groove (16) arranged therein, which is aligned along an outer wall (12) of said fence post (10) and has an inner cavity (18) and a neck portion (20) leading from said outer wall (12) to said inner cavity (18). Said inner cavity (18) is wider than said neck portion (20), so that said axial groove (16) comprises a recess (22) where inner cavity (18) and neck portion (20) meet. Said at least one fixing device (26) comprises a head portion (28) and two fastening claws (30), which are elastically deformable and comprise, at their end portions (36), a catch (42) for engaging by snap-fit behind said recess (22) of said axial groove (16). Said fixing device (26) further comprises at least one slot (32) for receiving at least one wire (34) of said fencing material.

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System for fixing fencing material to a fence post

Introduction

The present invention relates to a system for fixing fencing material to a fence post.

Prior Art

Fencing material is commonly fixed to fence posts using clamping means in the form of bent metal wire ends, which are pinched round the post by means of pincers. The bent metal wire ends can however not be used several times, as a metal wire end breaks after having been bent a number of times. Furthermore, it is rather time-consuming to work with such wire ends. Also, these wire ends are sharp and may consequently inflict bodily harm to people or animals if they get caught on such pinched metal wire ends. One may also get injured taking off the clamped metal wire ends in order to remove the fencing.

EP-0 367 313 discloses clamping means in the form of an elastically deformable cylindrical body with a longitudinal slot-shaped recess for gripping around a bulge of the fencing post. The clamping means comprises at least a horizontal wire recess for taking up and clamping at least a horizontal wire of the fencing material to the fence post. As this clamping means is elastically deformable, it can be fitted and removed many times and when properly carried out it cannot inflict bodily harm. In order to ensure good fixing conditions, the clamping means must exert quite a strong pressure on the bulge of the post when fitted. Special crimping tools are hence necessary for opening the longitudinal slot-shaped recess of the clamping means far enough so that it fits over the bulge of the fence post. The removal of the clamping means from the fencing post is particularly difficult, even with the help of tools, as the access to the longitudinal slot-shaped recess is restricted.

Object of the invention

The object of the present invention is hence to provide an improved system for fixing fencing material to a fence post, wherein the fencing material is easy to mount and dismount.

General description of the invention

In order to overcome the above-mentioned problems, the present invention provides a system for fixing fencing material to a fence post comprising a fence post with an axial groove aligned along an outer wall thereof. The axial groove has an inner cavity and a neck portion leading from the outer wall to the inner cavity, wherein the inner cavity is wider than the neck portion, so that the axial groove comprises a recess where inner cavity and neck portion meet. The system further comprises at least one fixing device comprising a head portion and two fastening claws. The fastening claws are elastically deformable and comprise, at their end portions, a catch for engaging by snap-fit behind the recess in the axial groove. The fixing device further comprises at least one slot for receiving at least one wire of the fencing material. In order to fix fencing material to a fence post, a wire is received in the slot of the fixing device, the fastening claws of which are then simply pushed into the axial groove until the catches of the fastening claws engage behind the recess in the axial groove. Indeed, as the fastening claws are being pushed into the axial groove they are being contracted in the neck portion. Once the catch of the fastening claws reach the inner chamber of the axial groove, the fastening claws elastically decompress and form a snap-fit assembly with the axial groove. It will be appreciated that the system according to the invention has the distinct advantage that no tools are necessary for fixing the fencing material to the fence post. Indeed, the fixing device can simply be pushed into the axial groove by hand.

According to an embodiment, the slot for receiving a wire of the fencing material is arranged in the fastening claws of the fixing device, the slot extending from the end portions of the fastening claws to an area where the wire received in the slot is in the vicinity of an opening formed in the outer wall by the

axial groove when the fixing device is received in the axial groove. The wire is received in the slot before the fixing device is pushed into the axial groove. Once the fixing device is engaged in the axial groove, it pushes the wire against the outer wall of the fence post. This slot is particularly advantageous for fixing a horizontal wire to the fence post.

According to another embodiment, the slot for receiving a wire of the fencing material is arranged in the head portion of the fixing device, the slot extending laterally from one side of the head portion to a central area thereof, in which the wire received in the slot is in the vicinity of an opening formed in the outer wall by the axial groove when the fixing device is received in the axial groove. A wire is introduced into the slot from the side of the fixing device before the fixing device is pushed into the axial groove. Once the fixing device is engaged in the axial groove, it pushes the wire against the outer wall of the fence post. This slot allows for some play in the location of the wire with respect to the fence post. Even if the wire is slightly off-centre, it can still be received in the slot and fixed to the fence post. This slot is particularly advantageous for fixing a vertical wire to the fence post, as a vertical wire will not always be aligned with the axial groove of the fence post. If the vertical wire is slightly off-centre in one direction, it can still be fixed to the fence post. If the vertical wire is slightly off-centre in the other direction, the fixing device is turned by 180°, so that the vertical wire can still be fixed to the fence post.

According to a further embodiment, the fixing device can also comprise a first and a second slot for receiving a first and a second wire of the fencing material. The first and the second slots can be arranged in the fastening claws of the fixing device and extend from an end portion of the claws to an area where the first and the second wires received in the first and the second slots are in the vicinity of an opening formed in the outer wall by the axial groove when the fixing device is received in the axial groove. The first and the second slots are preferably at an angle which substantially corresponds to the angle between the first and the second wires. The fixing device can now be used to fix a cross-over point of two wires of the fencing material to the fence post. A horizontal and a vertical wire can e.g. be received in the first resp. second slot

so that the fencing material cannot slide in any direction once the fixing device is engaged in the axial groove of the fence post. The fixing device with two slots is particularly advantageous for fixing an end of the fencing material to a first fence post.

In a preferred embodiment, the fixing device comprises a first and a second slot for receiving a first and a second wire of the fencing material. The first slot is arranged in the fastening claws of the fixing device and extends from the end portions of the fastening claws to an area where the first wire received in the first slot is in the vicinity of an opening formed in the outer wall by the axial groove when the fixing device is received in the axial groove. The second slot is arranged in the head portion of the fixing device and extends laterally from one side of the head portion to a central area thereof, in which the second wire received in the second slot is in the vicinity of an opening formed in the outer wall by the axial groove when the fixing device is received in the axial groove. The first and the second slots are preferably at an angle which substantially corresponds to the angle between the first and the second wires. This fixing device allows to tightly fix the first wire to the fence post but to give the second wire some play. The horizontal wire of the fencing material is preferably received in the first slot arranged in the fastening claws, whereas the vertical wire is received in the second slot arranged in the head portion of the fixing device. The horizontal wire is then tightly fixed to the fence post. If the vertical wire is in the vicinity of the axial groove of the fence post, it can be received in the second slot of the fixing device and fixed to the fence post.

The fastening claws are advantageously tapered towards the end portion of the fastening claws so as to facilitate the introduction of the fixing device into the axial groove. The neck portion of the axial groove can also be tapered towards the inner cavity, thereby further facilitating the introduction of the fixing device into the axial groove.

The fence post preferably has circular cross-section and can be flattened in the vicinity of the opening created in the outer wall by the axial groove. This allows for the fencing material to be fixed to the fence posts in a straight line.

Indeed, as the fencing material is fixed to the fence posts, it is not bent at its fixing point. In particular, if the fence post is used as a corner post, the fencing material can be smoothly curved around the corner, so that there is no sudden kink.

The head portion of the fixing device can have a rounded top surface, thereby giving the outer wall of the fence post and the head portion of the fixing device a continuous appearance when the fixing device is engaged in the axial groove.

The fixing device is preferably formed in one piece. Production costs and time of the fixing device can hence be reduced.

In a preferred embodiment, the system further comprises a supplementary fixing device which has a head, a shaft and fixing means. The head engages behind the recess in the axial groove of the fence post. The shaft has first and second ends, the first end being connected to the head and the second end protruding from the axial groove when the supplementary fixing device is received in the axial groove. The shaft further has at least one longitudinal slot therethrough for receiving at least one wire of the fencing material; the at least one longitudinal slot extends from the second end of the shaft to an area where the at least one wire received in the at least one longitudinal slot is in the vicinity of an opening formed in the fence post by the axial groove when the supplementary fixing device is received in the axial groove. The fixing means is received on the second end of the shaft for clamping the at least one wire received in the at least one longitudinal slot between the fence post and the fixing means. The supplementary fixing device is introduced into the axial groove through an opening at the top end of the fence post. The head of the supplementary fixing device slides down the axial groove. The shaft protrudes from the axial groove. One or more wires of the fencing material can be introduced in the one or more longitudinal slots arranged in the shaft. Once the wires are in place, the fixing means are used to clamp the wires between the fence post and the fixing means. The supplementary fixing device allows for an easy and secure fixing of fencing material to a fence post. Furthermore, by

simply rotating the supplementary fixing means in the axial groove, it is possible to adjust the alignment of the longitudinal slots arranged in the shaft. This is e.g. of great advantage in case the fence is to be erected on sloped terrain. The slot for receiving a horizontal wire of the fencing material can then be aligned so as to be parallel to the terrain on which the fence is erected, thereby causing the fence to follow the slope of the terrain.

According to a preferred embodiment, the shaft comprises a thread at least on its part protruding from the axial groove when the supplementary fixing device is received in the axial groove, and the fixing means is a nut. Once the wires are in place, the nut can be screwed onto the threaded end of the shaft and clamp the wires between the fence post and the nut. The supplementary fixing device allows for an easy and secure fixing of fencing material to a fence post. The nut can e.g. be simply tightened by means of a conventional wrench.

The supplementary fixing device advantageously comprises a preferably bevelled washer between the at least one wire and the nut. As the nut is tightened, the bevelled washer pushes the wire slightly into the axial groove, thereby providing tighter clamping of the wire.

It will be appreciated that an alternative method of using the above-mentioned supplementary fixing device can be considered. Instead of engaging the head of the supplementary fixing device behind the recess in the axial groove of the fence post, the fixing means of the supplementary fixing device can engage behind said recess in said axial groove of said fence post. The first end of the shaft is connected to the head and the second end of the shaft extends into the axial groove when the supplementary fixing device is received in the axial groove and is engaged in the fixing means. The shaft has a longitudinal slot therethrough for receiving a wire of the fencing material. The longitudinal slot now preferably extends from the first end of the shaft to the second end of the shaft. The fixing means of the supplementary fixing device is introduced into the axial groove through an opening at the top end of the fence post. The fixing means of the supplementary fixing device engages in the axial groove but is able to axially slide along the axial groove. The shaft extends into

the axial groove, so that the second end of the shaft can engage in the fixing means arranged in the axial groove of the fence post. A wire of the fencing material can be introduced into the longitudinal slot arranged in the shaft. By rotating the head of the supplementary fixing device, the shaft engages further into the fixing means and clamps the wire between the fence post and the head. At the same time, the wire is wound onto the shaft and is thereby also maintained in place. Furthermore, as the wire of the fencing material is wound onto the shaft, the wire is tensioned. The supplementary fixing device can hence be used as a tension device for tensioning a wire of the fencing material, thereby making a separate tension device redundant.

The fixing device and/or the supplementary fixing device can be made of either metal or plastic.

It will be appreciated that a cover can be fixed to the top end of the fence post in order to protect the fence post against water or dirt infiltration.

Detailed description with respect to the figures

The present invention will be more apparent from the following description of a not limiting embodiment with reference to the attached drawings, wherein:

Fig.1: shows a section view through a fence post;

Fig.2: shows a front and side view of a fixing device for fixing fencing material to a fence post;

Fig.3: shows the fixing device of Fig.2 fixed to a fence post

Fig.4: shows a front and top view of a supplementary fixing device for fixing fencing material to a fence post;

Fig.5: shows the supplementary fixing device of Fig.4 fixed to a fence post

Fig.1 shows a cylindrical fence post 10 having an outer wall 12 with one flattened region 14. An axial groove 16 is arranged in the fence post 10 on the flattened region 14 thereof. The axial groove 16 comprises an inner cavity 18 and a neck portion 20 leading from the flattened region 14 of the fence post 10 to the inner cavity 18. The neck portion 20 is tapered towards the inner cavity

18, and at the point where neck portion 20 and inner cavity 18 meet, the neck portion 20 is narrower than the inner cavity 18 so that the axial groove 16 comprises a recess 22 therein. Reference number 24 designates a fold of the fence post.

Fig.2 shows in a) a front view of a fixing device for fixing fencing material to a fence post and in b) a side view of the same device. Fig.3 shows the device of Fig.2 fixed to a fence post.

The fixing device 26 comprises a head portion 28 and two elastically deformable fastening claws 30. A first slot 32 for receiving a first wire 34 of the fencing material is arranged in the fastening claws 30. The first slot 32 extends from an end portion 36 of the fastening claws 30 to an area where the first wire 34 received in the first slot 32 is in the vicinity of an opening formed in the fence post 10 by the axial groove 16 when the fixing device 26 is received in the axial groove 16. A second slot 38 for receiving a second wire 40 of the fencing material is arranged in the head portion 28 of the fixing device 26. The second slot 38 extends laterally from one side of the head portion 28 to a central area thereof.

In order to fix a horizontal wire 34 of the fencing material to the fence post 10, the horizontal wire 34 is received in the horizontal slot 32. If a vertical wire 40 is in the vicinity of the fence post 10, the vertical wire 40 can be received in the vertical slot 38 arranged in the head portion 28 of the fixing device 26. The fastening claws 30 are then pushed into the axial groove 16 of the fence post 10. As the fastening claws 30 are pushed into the axial groove 16, they elastically compress until their catch 42 reaches the inner cavity 18. The fastening claws 30 then decompress and the catch 42 engages behind the recess 22 arranged in the axial groove 16.

Fig.4 shows in a) a side view of a supplementary fixing device for fixing fencing material to a fence post and in b) a top view of the same device. Fig.5 shows the device of Fig.4 fixed to a fence post.

The supplementary fixing device 44 shown in Fig.4 and 5 comprises a hexagonal head 46 and a threaded shaft 48. A first slot 50 for receiving a first

wire 34 of the fencing material is arranged in the threaded shaft 48. The first slot 50 extends over the whole length of the threaded shaft 48. A second slot 52 for receiving a second wire 40 of the fencing material is arranged in the threaded shaft 48 of the supplementary fixing device 44. The second slot 52 extends over the whole length of the threaded shaft 48.

The supplementary fixing device 44 is introduced into the axial groove 16 through an open top end of the fence post 10. While the threaded shaft 48 of the supplementary fixing device 44 protrudes from the axial groove 16, the head 46 of the supplementary fixing device 44 slides down the axial groove 16. The head 46 is maintained in the axial groove 16 by the recess 22 formed in the axial groove 16. Once the supplementary fixing device 44 is in its desired position, the first and second wires 34, 40 of the fencing material are received in the first and second longitudinal slots 50, 52 respectively. A washer 54 and a conventional nut 56, e.g. a hexagonal nut, are then introduced over the protruding end of the supplementary fixing device 44 in order to maintain the first and second wires 34, 40 in the longitudinal slots 50, 52. As the nut 56 is tightened, the washer 54, which has a bevelled portion 58, pushes the first and second wires 34, 40 of the fencing material partially into the axial groove 16 of the fence post 10. The nut 56 also pulls the head 46 tightly against the recess 22 arranged in the axial groove 16, thereby securely blocking the supplementary fixing device 44 in the axial groove 16 of the fence post 10.

Claims

1. System for fixing fencing material to a fence post, comprising a fence post (10) and at least one fixing device (26), characterised:

   - in that said fence post (10) has an axial groove (16) arranged therein, said axial groove (16) being aligned along an outer wall (12) of said fence post (10) and having an inner cavity (18) and a neck portion (20) leading from said outer wall (12) to said inner cavity (18), said inner cavity (18) being wider than said neck portion (20) , so that said axial groove (16) comprises a recess (22) where inner cavity (18) and neck portion (20) meet; and
   - in that said at least one fixing device (26) comprises a head portion (28) and two fastening claws (30), said fastening claws (30) being elastically deformable and comprising, at their end portions (36), a catch (42) for engaging by snap-fit behind said recess (22) of said axial groove (16), said fixing device (26) further comprising at least one slot (32) for receiving at least one wire (34) of said fencing material.

2. System according to claim 1, characterised in that

   said slot (32) for receiving a wire (34) of said fencing material is arranged in said fastening claws (30) of said fixing device (26), said slot (32) extending from said end portions (36) of said fastening claws (30) to an area where said wire (34) received in said slot (32) is in the vicinity of an opening formed in said outer wall (12) by said axial groove (16) when said fixing device (26) is received in said axial groove (16).

3. System according to claim 1, characterised in that

   said slot (38) for receiving a wire (40) of said fencing material is arranged in said head portion (28) of said fixing device (26), said slot (38) extending laterally from one side of said head portion (28) to a central area thereof, in which said wire (40) received in said slot (38) is in the vicinity of an opening

formed in said outer wall (12) by said axial groove (16) when said fixing device (26) is received in said axial groove (16).

4. System according to claim 1, characterised

in that said fixing device (26) comprises a first and a second slot (32, not shown) for receiving a first and a second wire (34, 40) of said fencing material;

in that said first and said second slots (32, not shown) are arranged in said fastening claws (30) of said fixing device (26) and extend from said end portions (36) of said fastening claws (30) to an area where said first and said second wire (34, 40) received in said first and said second slot (32, not shown) is in the vicinity of an opening formed in said outer wall (12) by said axial groove (16) when said fixing device (26) is received in said axial groove (16); and

in that said first and said second slot (32, not shown) are at an angle substantially corresponding to the angle between said first and said second wire (34, 40).

5. System according to claim 1, characterised

in that said fixing device (26) comprises a first and a second slot (32, 38) for receiving a first and a second wire (34, 40) of said fencing material;

in that said first slot (32) is arranged in said fastening claws (30) of said fixing device (26), said first slot (32) extending from said end portions (36) of said fastening claws (30) to an area where said first wire (34) received in said first slot (32) is in the vicinity of an opening formed in said outer wall (12) by said axial groove (16) when said fixing device (26) is received in said axial groove (16);

in that said second slot (38) is arranged in said head portion (28) of said fixing device (26), said second slot (38) extending laterally from one side of said head portion (28) to a central area thereof, in which said second wire (40) received in said second slot (38) is in the vicinity of an opening formed

in said outer wall (12) by said axial groove (16) when said fixing device (26) is received in said axial groove (16); and

in that said first and said second slot (32, 38) are at an angle substantially corresponding to the angle between said first and said second wire (34, 40).

6. System according to any of the previous claims, wherein said fastening claws (30) are tapered towards said end portions (36) of said fastening claws (30).

7. System according to any of the previous claims, wherein said neck portion (20) is tapered towards said inner cavity (18).

8. System according to any of the previous claims, wherein said fence post (10) has circular cross-section and wherein said fence post (10) is flattened in the vicinity of said opening created in said outer wall (12) by said axial groove (16).

9. System according to any of the previous claims, wherein said head portion (28) of said fixing device (26) has a rounded top surface.

10. System according to any of the previous claims, wherein said fixing device (26) is formed in one piece.

11. System according to any of the previous claims, further comprising a supplementary fixing device (44), said supplementary fixing device (44) comprising:

a head (46) for engaging behind said recess (22) in said axial groove (16) of said fence post (10);

a shaft (48) having first and second ends, said first end being connected to said head (46) and said second end protruding from said axial groove (16) when said supplementary fixing device (44) is received in said axial groove (16), said shaft (48) having at least one longitudinal slot (50, 52) therethrough for receiving at least one wire (34, 40) of said fencing material; said at least one longitudinal slot (50, 52) extending from said second end of said shaft (48) to an area where said at least one wire (34, 40) received in said at least one longitudinal slot (50, 52) is in the vicinity of where neck portion (20)

and outer wall (12) meet when said supplementary fixing device (44) is received in said axial groove (16); and

fixing means (56) received on said second end of said shaft (48) for clamping said at least one wire (34, 40) received in said at least one longitudinal slot (50, 52) between said fence post (10) and said fixing means (56).

12. System according to claim 11, wherein said shaft (48) comprises a thread at least on its part protruding from said axial groove (16) when said supplementary fixing device (44) is received in said axial groove (16), and wherein said fixing means (56) is a nut.

13. System according to claim 12, wherein said supplementary fixing device (44) comprises a washer (54) between said at least one wire (34, 40) and said nut (56).

14. System according to claim 13, wherein said washer (54) comprises a bevelled portion (58).

15. System according to any of the previous claims wherein said fixing device (26) and/or said supplementary fixing device (44) are made of metal.

16. System according to any of the previous claims wherein said fixing device (26) and/or said supplementary fixing device (44) are made of plastic.

Fig. 1

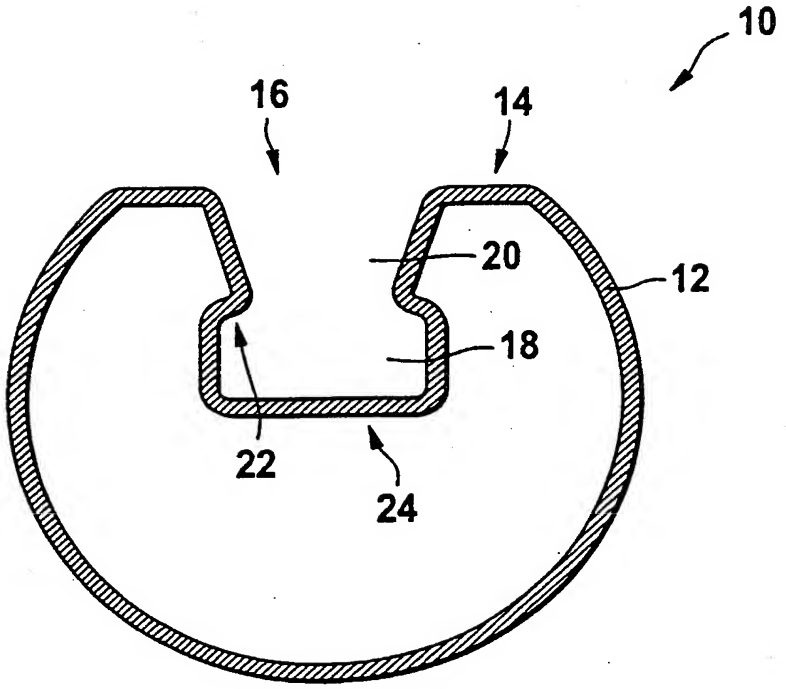


Fig. 2a

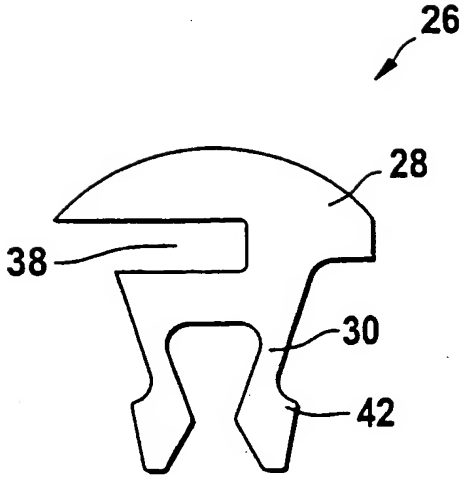


Fig. 2b

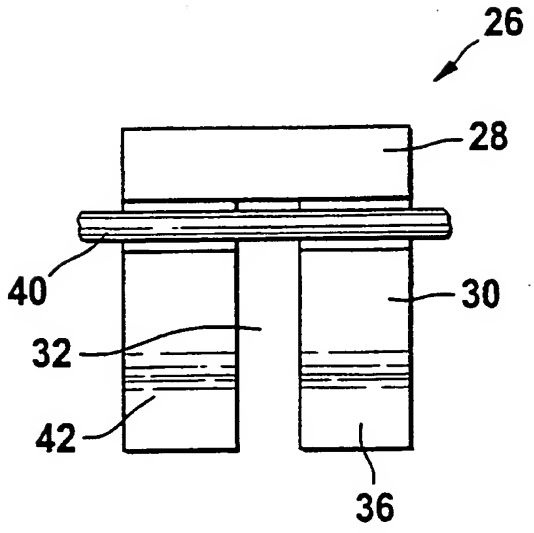


Fig. 3

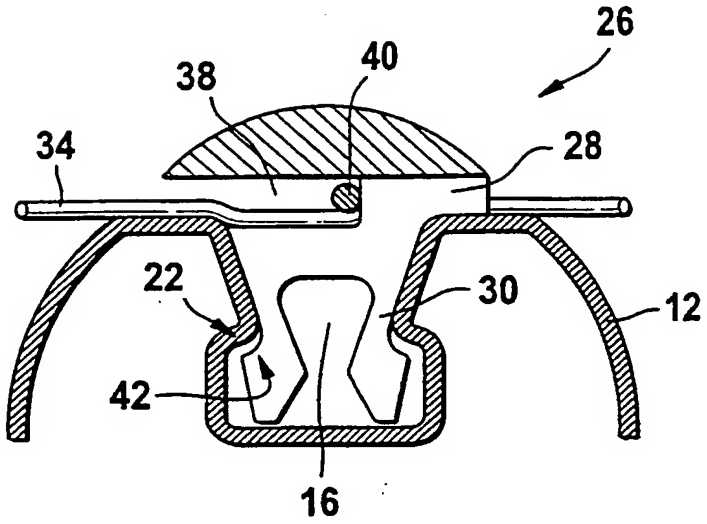


Fig. 4a

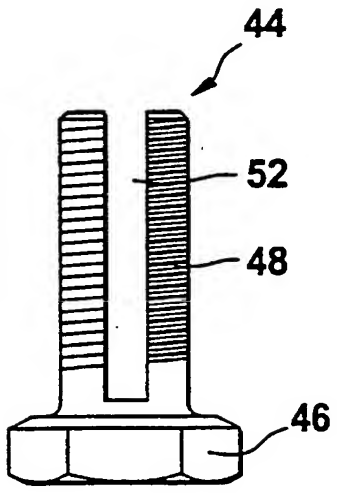
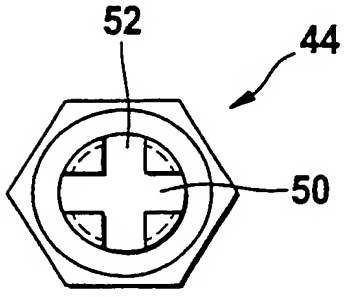


Fig. 4b



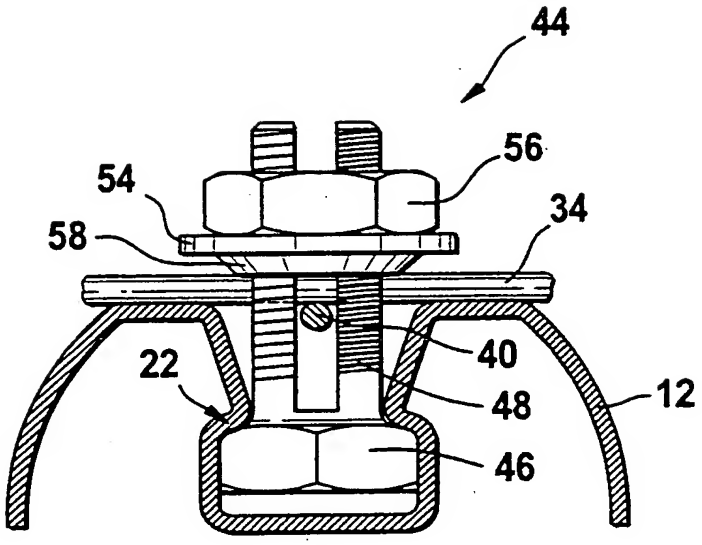


Fig. 5

INTERNATIONAL SEARCH REPORT

[illegible] Application No
PCT/EP 01/04384

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E04H17/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 93 20313 A (ENROTH ULF ;LILJA LARS (SE)) 14 October 1993 (1993-10-14) the whole document	1,2,6,9, 10
Y		3
X	DE 34 22 049 A (RECKENDREES WILHELM) 19 December 1985 (1985-12-19) page 5; figures	1,2,9,10
X	US 4 804 166 A (MAKUS GILBERT) 14 February 1989 (1989-02-14) column 2, line 39 -column 3, line 8; figures 1-4	1,15
Y	EP 0 062 690 A (JOHANNSEN EGGERT) 20 October 1982 (1982-10-20) page 2, line 32 -page 3, line 16; figure 1	3
A		4-6,11

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[X] Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
28 September 2001	08/10/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Kriekoukis, S

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

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